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Four Leg News

*“The price of a
good dog is a
broken heart”*

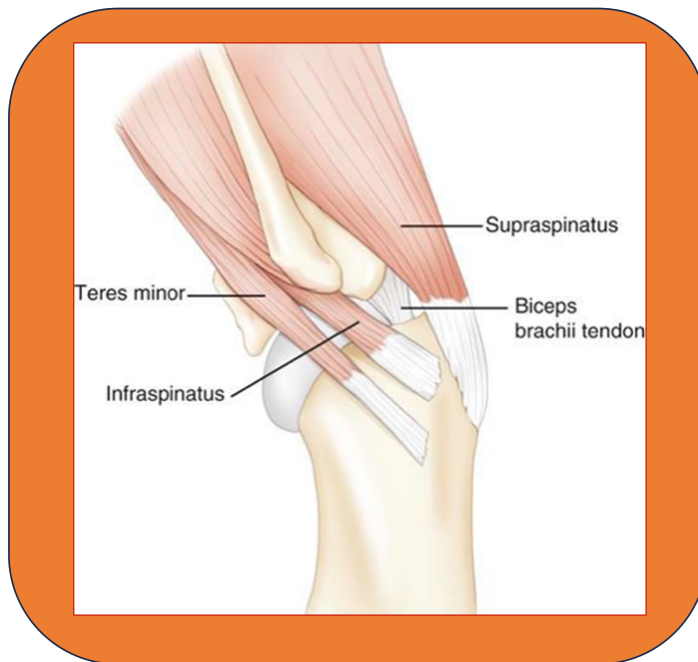
- My Brother-in-Law,
Stephen Hughes

Have you seen an infraspinatus contracture? Would you recognize one? Would you know what to do with an infraspinatus contracture case? Read on to learn more about this conditions!!

Cheers!

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The Infraspinatus Contracture Issue



Infraspinatus

- **Origin:** Infraspinous fossa of the scapula
- **Insertion:** Lateral aspect of the greater tubercle on the humerus (bursa underneath)

Action

- **Shoulder abduction**
- **Lateral rotation of the shoulder**
- **Flexion or Extension of the shoulder joint, depending upon the limb position**
- **Stabilizer of the lateral shoulder joint**

Preamble

Searching the literature for **Infraspinatus Contracture** references yields mostly case examples, and a couple of papers that simply describe the condition as part of papers about ‘shoulder conditions’. Of the papers that could be retrieved, 9 case examples were found. The earliest paper dated back to 1972.¹ Diving in, one of the case examples was for an avulsion of the Infraspinatus tendon.² (Cool, because that is a condition, I’ve actually seen once!)

General Information

“The infraspinatus’ role is to abduct and rotate the humerus as well as flexion and extension of the shoulder joint; acting as a dynamic stabilizer. Contracture of the infraspinatus is uncommon, but is seen in active medium to large breeds. It is usually unilateral, but there are bilateral cases. It is thought to be a muscle disorder due to chronic microtrauma during explosive exercise. It often begins with sudden forelimb lameness, shoulder discomfort and swelling of the infraspinatus muscle after extreme exercise, which resolves within 2 – 6 weeks. The muscle undergoes fibrosis and contracture, resulting in a non-painful circumducted gait and reduced range of motion. While in position, the elbow is adducted and paw abducted.”³

Case Series

Of the 8 case examples of infraspinatus contracture, 6 were in male dog, 1 in a female (and in one case, sex was not reported). Breeds reported were English Pointer, Golden Retriever, Labrador Retriever, Belgian Shepherd, German Pointer, Eurasian, Elkhound, and Greyhound. Dog ages ranged from 3 years to 7 years. Three of the cases had bilateral injuries.

History

Four of the dogs had a history of becoming lame while hunting / trialing, and the Greyhound after racing. The other dogs reported incidences of walking for hours on a sloped surface for one and falling in a hole for the other. Incidence associated with injury was not reported in one dog. Most of the cases presented with clinical signs of infraspinatus contracture months after the incident (ranging from 1 month to 16 months after injury). In three cases the dogs were brought in for veterinary evaluation immediately after injury, and treatment (typically rest and NSAIDs) yielded resolution of lameness in the short term, only to show up as a typical infraspinatus contracture 3 weeks to 3 months later.

Physical Examination

Typically, the posture described as follows: Elbow adducted against the chest wall and external rotation of distal limb. [Note: This nomenclature is ‘technically’ inaccurate. Technically, the posture would be as a result of external rotation of the humerus relative to the scapula, with the forelimb held close to the thorax and an outward positioning of the distal limb.] Gait was described as circumduction / outward swing of the foreleg with a carpal flip prior to stance.

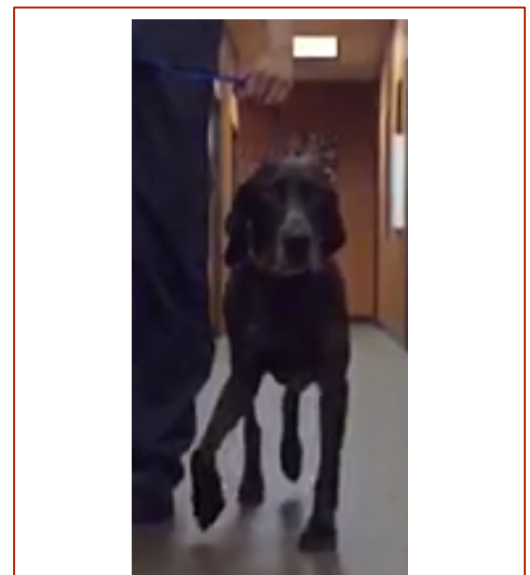


Fig. 12. Characteristic gait of an infraspinatus contracture patient. Note the external rotation of the humerus with elbow adduction and paw abduction during swing phase.

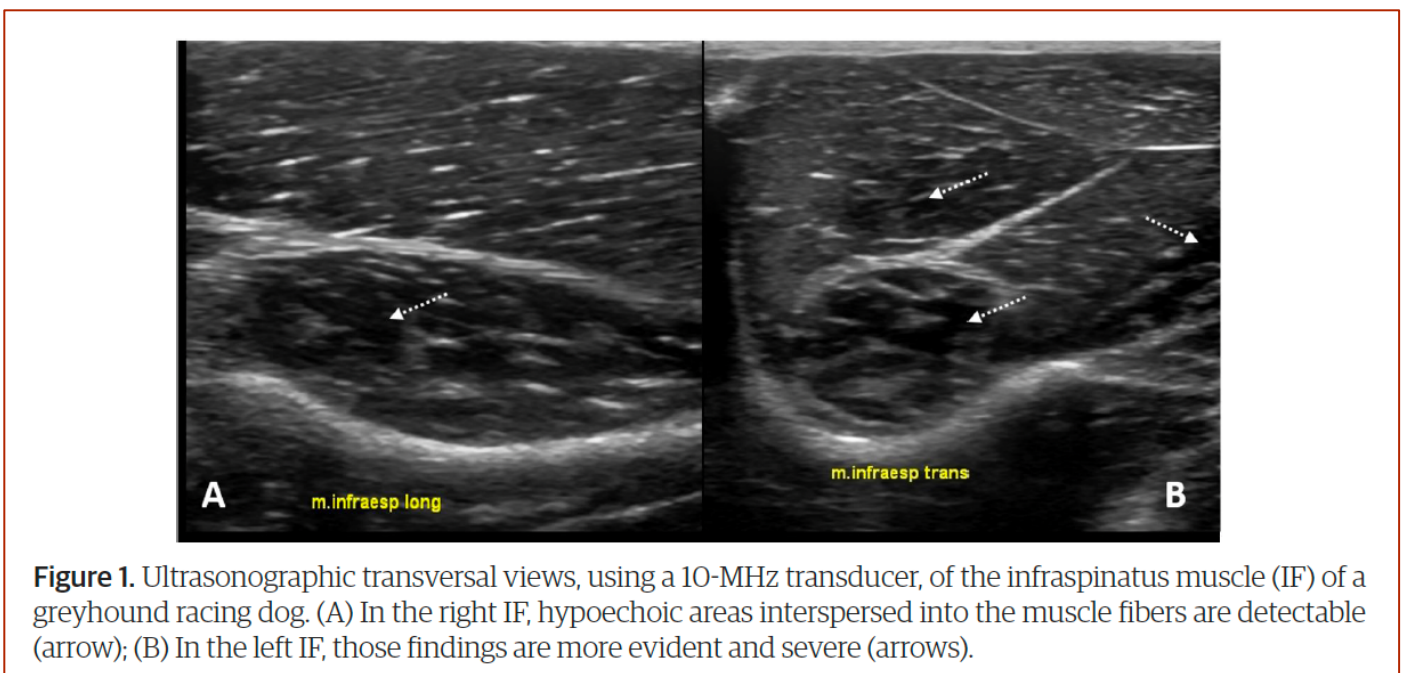
Picture from Stokes & Dycus 2021

Dogs that were presented acutely tended to have pain on palpation of the infraspinatus muscle / tendon / infraspinatus fossa and/or swelling of the greater tubercle. Most often at the later stages of evaluation, the examiners noted atrophy of the shoulder muscles (typically infraspinatus and sometimes supraspinatus and deltoid). Reduced range of motion was noted (typically with flexion), sometimes accompanied by pain.

Diagnostic Imaging

Radiography was typically normal, however in one case, soft tissue swelling could be detected acutely, however later in that case (as well as in separate case) bone formation could be seen in the area of attachment of the infraspinatus.

Ultrasound findings tended to show that the infraspinatus was ‘smaller with an uneven, granular appearance’, ‘disorganized hyperechoic areas’, ‘irregular periosteum & mineralized areas at insertion & tendon of infraspinatus’, and ‘muscle fiber discontinuity, hypoechoic areas at the deepest parts of the infraspinatus’.



Picture from Mestieri et al 2021

Two dogs received a CT Scan. The CT of the dog with the 7 week previous history of injury showed sclerotic and irregular bone at infraspinatus insertion, mineralized structure and cavity in the tendon. (i.e. chronic tendinopathy). One dog that was evaluated acutely showed moderate swelling of infraspinatus and supraspinatus.

One dog had an MRI that showed muscle degeneration and fibrous tissue development.

Surgical Treatment

Six of the 8 dogs had a tenectomy. Most of them as the first treatment option, and one as a result of poor results and progression of clinical signs after 4 weeks of rest. One dog also had a fasciotomy of the infraspinatus to release internal pressures in the muscle.

One case reported that fibrous adhesions were noted over the lateral aspect of the shoulder joint, adhering to the joint capsule and blending in the distal aspect and insertion of the infraspinatus muscle. The joint capsule appeared thickened due to adhesions. [Note: this was in a dog with a 1 year history of lameness.]

Three cases noted that transection of the infraspinatus allowed for normal positioning of the limb and functional movement of the shoulder.

Histopathology

Histopathology was reported in four cases. One noted a few areas of necrosis and degenerative changes. The second reported degenerative myopathy with fibrillar degeneration, necrosis and fibrosis of infraspinatus. A third case with bilateral disease found myofiber degeneration, abnormalities in fiber size, endo- and perimysium fibrosis, as well as calcified myofibers, adipose tissue, muscle regeneration and some mononuclear inflammatory infiltrates on one side and muscle fiber degeneration, necrosis, hemorrhage and edema on the other side. The fourth case had atrophied and hypertrophied muscle fibers, with multifocal fibrosis and some intramuscular hemorrhage, mineralization and fat tissue infiltration, with no inflammatory cells.

Surgical Outcomes

Dogs that received a full infraspinatus transection were clinically normal within 2.5 or up to 10 months following surgery. One dog that received a partial transection (7/8th of the tendon was cut) continue to have circumduction at a trot. All of the working dogs and the one racing dog returned to work / training.



Fig. 1 Front view of the patient with bilateral adduction and external rotation of both forelimbs.



Fig. 4 Front view of the patient three weeks after the second surgery showing resolution of postural abnormalities shown in Fig. 1.

Pictures from Franche et al 2009

Physical Therapy Treatment

Two cases used physiotherapy as their primary treatment.^{7,9} In the first case, the dog was 7 weeks after injury (falling in a hole).⁷ This dog was treated with aspiration of the bursa, PRP injection, and physiotherapy that consisted of massage, range of motion, manual therapies to the spine and hips. At 3-months this dog was no longer lame and at 5-months it was good with heavy exercise.

In the second case (the racing Greyhound), the dog was treated with 30 days of rest, carprophen, and therapeutic ultrasound.⁹ At follow up, there were no signs of lameness, reduced motion, or pain. The dog progressively returned to training.

Conclusions & Thoughts

While infraspinatus contractures are uncommon, it is important for the rehabilitation practitioner to be aware of the condition and its appearance (acutely and chronically). Surgical intervention seems to be the historical norm for treatment. However, with two papers citing physical therapeutics as the key intervention, and other papers showing the rest alone does not yield favourable results, it would be prudent to suggest that physiotherapy / rehabilitation be offered as a first-line option. This would be most beneficial if the condition is recognized acutely so as to prevent the contracture in the first place.

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